

Tuberculosis of Joints

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INFECTION of a joint by tuberculosis is usually associated with a similar infection of the adjacent bone. Indeed, in most cases the disease commences in the bone and extends to the joint. In all cases the infection is blood-borne, and it may be taken as evidence of a tuberculous septicæmia, past or present. The disease is therefore always secondary to a focus elsewhere, most often in the bronchial or abdominal lymph-glands. Both the human and bovine strains of the bacillus tuberculosis are important in the production of the disease. Since Koch, about thirty years ago, made the dogmatic statement that the bovine type is harmless to man, much work has been done on the relative importance of these two strains in human pathology. In Great Britain, A. Stanley Griffith has determined the type of bacillus in some three thousand cases of tuberculosis. Of the three thousand, about seven hundred were infections of the bones and joints, and included cases from England and Scotland. He found that the bovine strain was responsible for eighteen per cent. of bone and joint tuberculosis in England, and for forty-two per cent. in Scotland. These percentages are both higher than those in any of the Continental countries or in the United States of America. Griffith also points out that, though the bovine type is found in only a fraction of the cases investigated, this strain is the cause of much trouble in other parts of the body, that it produces a pathology indistinguishable from that of the human type, and that it equals the latter in virulence.

The reaction of the bones and joints to infection by the bacillus tuberculosis is similar to that seen in the other tissues of the body, namely, the formation of the tubercle and tuberculous granulation tissue. The disease is a low-grade infection in which the bone is rarefied and destroyed; new bone formation being slight or absent. Fluid, serous or purulent, collects in the synovial cavity of the affected joint. The capsule of the joint is thickened, infiltrated, and softened by the tuberculous process, and is at the same time stretched by the contained fluid. Protrusions of the synovial membrane occur through the weaker parts of the capsule. These herniations may grow to a considerable size before rupturing.

Tuberculous arthritis is a serious disease with a considerable mortality rate. It is the cause of much suffering, deformity, loss of function, and, in those patients who recover, a long and tedious convalescence. An early and positive diagnosis is therefore desirable. In forming an opinion, the patient's general condition, as well as the state of the affected joint, its surroundings, and the X-ray appearances, should be considered. The general health is often impaired. The temperature is often subnormal in the morning, and may rise to 99° or higher in the evening. The earliest local sign is usually limitation of movement. Swelling is present almost from the first. Pain is slight or variable in the first stages. Later, marked diffuse swelling of the joint, local heat, deformity, and night starts make the diagnosis more obvious. X-ray examination is helpful in those cases where the disease starts primarily in the bone, but otherwise its evidence is inconclusive in early cases. Of the special tests, the best and most logical is the bacteriological; the finding of the

bacillus tuberculosis in the joint fluid is conclusive. A negative result is of little value. The most important of the pathological tests are :—

1. The presence of an excessive number of lymphocytes in the synovial fluid.
2. Histological examination of a piece of excised synovial membrane.
3. Animal inoculation of joint fluid.
4. The tuberculous complement fixation test.
5. The red-cell sedimentation rate.

The exclusion of other joint conditions which mimic tuberculosis is important. For example, arthritis produced by the pyogenic micro-organisms, particularly the staphylococcus and the streptococcus, may be of a chronic nature and be clinically indistinguishable from a tuberculous infection. This applies to psoas abscess as well as to joints (Behrman). If traumatic synovitis does not clear up in a few weeks, the joint should be suspected of being the seat of tuberculosis. Syphilitic infection must also be kept in mind. In congenital syphilis the articular lesion may be very similar to the tuberculous white swelling, but may be distinguished from the latter by the fact that the congenital disease is usually bilateral. It is also less painful than tuberculosis, and is often associated with the other stigmata of congenital syphilis. Cantonnet considers this arthropathy as important in the diagnosis of this disease as the classical signs of Hutchinson's triad.

In a recent paper, Ghormley and Bradley point out the value of radiograms in the prognosis of spinal caries. They base their opinion not only on observations of the bony lesion itself, but also of the surrounding abscess. The response to treatment of the patient is estimated by the changes seen in a series of X-ray photographs taken at intervals of several weeks. The changes on which stress is laid are : (1) Changes in the calcification; this is due to an increase or decrease in the calcium content of the broken-down material, and appears in the X-ray as a dense white shadow, either spotty or uniform. It is of little value as a guide to healing. (2) The re-establishment of the bony trabeculæ; this is shown by an improvement in detail of the X-ray picture, and is therefore a reliable sign of repair. (3) Increasing destruction of the bony tissue; if shown over a series of radiograms is a bad omen; it is, however, shown at first by most cases until they begin to respond to treatment. (4) The establishment of bony fusion between vertebræ; this is considered to be the most favourable sign from a prognostic point of view. These authors point out a peculiar erosion of the anterior border of the centrum in those cases with abscesses; the erosion is seen in the lateral view, in which it forms an oval cup-shaped depression. The condition is not unlike that found in the vertebral body due to aneurism. The antero-posterior radiograms of these cases show the presence of an abscess which is fusiform or globular in shape, according to the number of vertebræ involved. It is thought that the abscess spreads from the original lesion by dissecting up the anterior common ligament, more or less surrounding the bodies by pus, and that the erosion is due to pulsation transmitted through the abscess cavity from a normal aorta.

The figures given below are based on the results obtained by Mr. H. P. Malcolm

at the Municipal Hospital at Graymount. During the decade ending 1931, he has discharged from this hospital 145 patients, the reason for discharge being—

Disease arrested	-	-	-	124	= 85.5 per cent.
Improved	-	-	-	2	= 1.4 per cent.
Unimproved	-	-	-	3	= 2.1 per cent.
Died in hospital	-	-	-	9	= 6.2 per cent.
Died after discharge	-	-	-	7	= 4.8 per cent.

The number of relapses after discharge (eight) reduced the total percentage of cures to eighty. The total mortality for ten years is eleven per cent. This figure is reduced to eight per cent. if we include fifty-seven cases remaining in hospital at the end of the period. On account of limited accommodation, this institution is reserved mainly for patients unable to walk.

Of the 145 admissions, thirty-five were cases of spinal caries. The average time in hospital was three years and eight months, but varied from just over one year to ten years. There were five deaths in hospital, a mortality rate of fourteen per cent. ; two deaths after discharge raise this figure to twenty per cent. The outlook in three cases was hopeless on admission. This gives a mortality rate of twelve per cent. in treated patients. Three of the five children who died were three years of age or under, the other two were both six years old. The youngest child on admission was one year and ten months, and the oldest fifteen years. Nineteen of the thirty-five patients were five years of age or under when admitted. The patient whose treatment lasted ten years was admitted at five years of age, and when seen two years after discharge was strong and well and without deformity. Recurrence of deformity took place in five patients, two of whom are well in spite of deformity. Of the remaining twenty-three, two cannot be traced, and twenty-one are well and have little or no deformity. This may be taken as sixty per cent. known cure.

Hip-joint cases numbered thirty-eight. The average stay in hospital was two years and eight months. The age on admission varied from four years to fourteen years. Hospital treatment lasted from 128 days to six years. In this form of the disease no deaths occurred in hospital, but two patients died after discharge, a mortality of 5.2 per cent. Of the rest, thirty-three were discharged with the disease arrested, one improved, and two unimproved.

In twenty-three cases of tuberculosis of the knee-joint, the average duration of treatment in hospital was three years and one month, the extremes being 485 days and seven years 132 days. There was one death, a mortality of four per cent. Relapse occurred in three. The cures numbered eighteen. Amputation was necessary in two.

Multiple lesions were present in twenty-two patients, necessitating an average stay in hospital of two years and seven months. The deaths were three in hospital and three after discharge, making a total mortality rate of twenty-seven per cent. Fifteen are well.

There was no mortality in the remaining twenty-seven cases. The disease was arrested in all with the exception of two, in which amputation was performed for incurable disease of the tarsus.

SUMMARY OF RESULTS.

Situation of Disease		Disease Arrested	Improved	Unimproved	Relapsed	Died	Total
Spine	-	22	...	1	...	7	35
Hip	-	33	1	2	...	2	38
Knee	-	18	1	...	3	1	23
Various	-	27	...	...	...	...	27
Multiple	-	16	...	...	...	6	22

TREATMENT.—In the absence of an efficient specific therapy, treatment is still a matter of opinion and perhaps of fashion. The routine treatment carried out at Graymount may be summarized as “fresh air, such sunshine as is available, abundant nourishment, and prolonged rest in bed.” Local treatment has been entirely conservative. Spinal patients are given postural treatment without any severe fixation, and on discharge are usually provided with a poroplastic jacket as a precautionary measure. Hip-joints are treated by extension without splints, and, later, plaster is applied in those cases in which a stiff joint is expected. In disease of the knee, deformity is gradually reduced by extension in a Thomas’s splint; after this a plaster splint is used, and finally a walking caliper. The end results of this treatment are tabulated above. They compare favourably with most published.

My best thanks are due to Mr. H. P. Malcolm, who has put at my disposal the data collected by him at Graymount Municipal Hospital during the past ten years.

REFERENCES.

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REVIEW

THE MEDICINAL AND POISONOUS PLANTS OF SOUTHERN AFRICA.

By Professor John Mitchell Watt and Maria Gerdina Breyer-Brandwijk. Edinburgh: E. & S. Livingstone, 1932. pp. 314. Price 25s.

It can be said of many books that they are interesting, that they are unique, or that they are valuable. In the case of this volume we can truly say that this book is interesting, and while being decidedly unique, it is also most valuable wherever one may turn its pages. It deals with much of the folklore of the native races of Africa, and with the vegetable flora of that prolific country. We read of racial ideas as to the virtues of various preparations of roots, barks, and leaves of plants, shrubs, trees, and flowers. There are accounts of various poisonous effects on animals as a result of eating obnoxious plants. There is much of interest and value in the pharmacological effects produced by various preparations. Throughout the book are beautiful illustrations, many in colour. The authors have provided four separate indices, so that plants can be traced through the English, African, or native equivalents.

This should prove indeed to be a valuable book of reference, and will long serve to preserve a record of the folk medicine of Southern Africa. The volume is very well produced, and both authors and publishers are to be congratulated upon it.

—F. M. B. A.